PROFESSIONAL SERVICES

MARKETS, VENDORS, FORECASTS

INPUT

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This study contains three sections:

The first section is the overview of the Professional Services markets, issues and trends, five-year forecasts, and recommendations.

The second section contains an overview of the commercial systems integration market.

The third section includes professional service vendor profiles for the major commercial vendors, who in most cases also have revenue from software products.

I PROFESSIONAL SERVICES MARKETS

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I ISSUES, TRENDS, AND EVENTS

- While the information services industry has experienced a slower pace of growth in the last year as the result of a slower economic climate throughout U.S. businesses, the impact on the professional services mode of the industry has been more moderate. This is due, in part, to the market pressures faced by corporate America that call for an improved quality and quantity of information support services. Professional services firms meet these needs by consulting with users on solutions to information services problems, developing or converting software for application on new or existing systems, and by operating and maintaining systems at peak levels through programs of facilities management or training and support of users.

- INPUT estimates that growth in user expenditures for contracted professional services from 1984 to 1985 was a healthy 18% and that this rate will continue on an annualized basis to 1991.

A. MARKET PRESSURES

- The key market forces that are impacting professional services (see Exhibit I-1) include:

  - The need to meet growing information systems demands in the face of a shortage of skilled in-house staff and a more complex technical environment.

EXHIBIT I-1

MARKET PRESSURES

- Reduced In-House Capability
- Pervasiveness of Information Systems
- Demands for Productivity

- The pervasiveness of information systems within client organizations and the criticality of these systems to corporate revenue generation.

- The demand, at the highest levels of the organization, for a more productive utilization of current corporate assets, including capital investments, human resources, and information assets.

I. GROWING DEMANDS - SHRINKING STAFFS

- While capital spending continued its downturn in 1985, INPUT expects a long-term positive growth in the installed base of computers. Much of the installed data processing equipment lacks the transaction speed and memory to satisfy future requirements. Some acquisitions are aimed at upgrading this equipment and converting or replacing the associated software systems. Commercial firms (e.g., American Airlines, Firestone, Northrop) as well as federal government agencies (e.g., Internal Revenue Service, Customs Service, Department of Defense) have planned and are upgrading systems that will support the ever-increasing requirements of information services well into the 1990s.

  - The aging of equipment in the face of advancing technology and the increasing demands placed on systems in support of a growing list of business user needs now require that replacements of obsolete equipment be made on a timely basis.

  - This replacement market is spurred by the additional capabilities of new systems. With information systems now at the very heart of corporate business, it is unlikely that management will risk the effects of under-capable systems.

- While professional services expenditures are likely to grow in support of existing systems, the key to the growth of professional services activities

through new systems selection, installation, and management may be the speed with which small businesses automate. While even in economically tough times the largest corporations find such investments burdensome, but able to do, it is the little company, hurt by the economy, that does not have the "contingency resources" to make capital investments when cash is desperately needed elsewhere. Only when these businesses experience revenue and profit increases or make longer-term acquisition plans will capital investments and, therefore, professional services involving these new systems show a dramatic increase.

- Demand means not only more hardware but more and better solutions to an ever increasing complexity of technology that includes "super systems" that integrate several applications bound to fourth generation languages, data base management systems, code generators, and the like. Such systems may also include data that ranges from personal to corporate and requires micro-mainframe links and other extensions to intelligent workstations to handle end-user computing in a secure, data protected, and private system.

    - While the desire is present to integrate applications, there are few total solutions available for linking information systems to overall corporate plans. This is especially true in a multi-vendor environment that calls for the integration of voice, data, and image input and output. The interest in integrating applications in this environment has made the development and management of information systems much more complex. Many corporations lack the internal skills to handle the technical demands of these integration efforts.

    - Perhaps the good fortune of the current economy for professional services vendors is the shortage of skilled in-house workers. A shortage of skilled information systems personnel in any company, especially in a rapidly changing technical environment, makes professional services contracting quite attractive and necessary.

- What seems to have occurred with respect to the continuation of employment of an in-house technical staff is tied, in part, to the financial health of the individual company and to the criticality of information systems to the company's businesses.

  - In "smoke stack" industries where information systems may not be central to the generation of revenue, the technical staff has been reduced to a point where little new development is possible and where the focus of the remaining staff is on the maintenance of existing systems.

  - Businesses that have been marginally successful in this slower economic climate seem to have taken one of two courses. If the current systems are adequate, the staff has likely been reduced, the in-house focus is on operation, and only high priority development efforts are contracted out. On the other hand, in an environment of aging equipment, the staff is likely in place, focused on maintenance, and all new starts are contracted out.

  - In situations where the information systems are critical to revenue generation or to remaining competition, some amount of work is contracted, regardless of the current economic impacts.

  - This segmentation has also served to differentiate sources of professional services contracts. On the one hand, corporate MIS is bundling development efforts into larger and larger projects. On the other, individual work units, unable to meet their needs quickly and efficiently through an overworked in-house staff, are also contracting small professional services efforts.

2. PERVASIVENESS OF INFORMATION SYSTEMS

- The impact of information systems is now visible throughout the corporation. The growing body of end users, employing a range of personal computers and small business minicomputers, will experience strong growth. And, user interest in more powerful and complex systems will tax internal staff resources and expertise with demands for capabilities and connectivity.

- Company management has shown an increasing desire to automate the very core of their businesses. This has led to the need for more complex hardware, software, and communications solutions. Professional consultation during all stages of development, from conception to implementation, has become a necessity rather than an afterthought.

- The acceptance of automation as a competitive edge will continue to have a positive impact on the market. Once management is willing to invest in automation for this advantage, they are unwilling to wait for internally-developed solutions in such areas as decision support, customer service, sales/marketing, and time management.

- The pervasiveness of information systems has brought forth a concern for the proper management of the corporation's information systems assets, including hardware, personnel, and data/information. Chief executives now call for information resource management, a "master plan" for these vital systems.

    - These companies have moved from a reactive to a proactive mode, from a product orientation to a user orientation, from a functional orientation to a "right information to the right person at the right time" orientation. Management has now focused on containing costs and leveraging current assets, reducing maintenance costs, and prioritizing development efforts.

3. PRODUCTIVITY DEMANDS

- Management has also focused on productivity increases. There is general consensus both within the user community and the vendor community that there is an absorption bottleneck, a technical saturation.

- The proliferation of "solutions" has caused user confusion. Company managers are finding it increasingly difficult to choose among alternatives and, in the process, postponing change until "the" solution emerges.

- Some companies have taken a deliberate "wait and see" attitude that calls for the development or adoption of "industry-wide" standards before moving further along the technical path.

- With the current "breather" from the rapid pace of development, many companies believe this is a time to rethink the direction and impact of their information systems efforts and to engage in an assessment of their DP function.

B. VIEWS OF CONTRACTORS

- While failures in large, complex projects receive "front page" attention, overall, professional services vendors have satisfactorily developed sophisticated applications for leading clients and, in the process, established an image of credibility. User organizations typically cite several advantages--and disadvantages--of contracting with professional services vendors.

1. ADVANTAGES OF USING PROFESSIONAL SERVICES VENDORS

- Contracting some development or operational activities gives a company the ability to balance workloads without changing staff counts as requirements are added or removed.

- Contractors may be less expensive than fully-burdened in-house staff, if a ceiling is used in the contracting. (It is for this reason that users are frequently opting for fixed-price bids.)

- Contractors' objectivity, which includes the ability of the contractor to take an unbiased approach to a problem without being affected by internal client politics is, less frequently, also a consideration in employing professional services vendors.

- Expediency, in terms of accelerated schedules and fewer problems than if the work were performed in-house, is also a benefit of contracting.

2. DISADVANTAGES OF USING PROFESSIONAL SERVICES VENDORS

- There is always the risk of non-performance on the part of the contractor. The vendor may not deliver an acceptable product and/or not deliver it on time or within budget.

- The time it takes the vendor to understand the user organization and its objectives, to come up to speed, is longer than any in-house personnel would require. Users are reluctant to pay for this education and frequently offer repeat business to current vendors to avoid educating another vendor.

    - Related to this "learning curve," users are becoming more technologically sophisticated--or at least think they are--and are requiring a higher level of competence on the part of vendor personnel. Unless vendors pass along the additional costs of these "super staffers," they could be faced with shrinking margins in these situations.

    - Sometimes, users are not more sophisticated, but think they are. The costs to the vendor in these cases come from the time it takes to re-educate the users without alienating them.

- When professional services vendors are employed the company does not develop the expertise inherent in the project within their in-house personnel. The skills developed during the course of an engagement remain with the vendor, and the user remains dependent on the contractor. Some managers believe that this weakens the company's ability to do additional work. They reason that, since in-house staff skill is not built during a project, when the contractor leaves, the expertise leaves.

II MARKET FORECASTS

A. PROFESSIONAL SERVICES MARKET OVERVIEW

1. MARKET FORECAST

- INPUT forecasts that the professional services market will grow from a 1986 base of $12.5 billion to $28.7 billion in 1991, an average annual growth rate (AAGR) of 18% (see Exhibit II-1). As discussed previously, keys to this growth include:

  - An economic climate that will result in a reduced in-house capability to maintain existing systems while meeting the complexities of new requirements.

  - The pervasiveness of information systems in corporate America, now a critical ingredient in capturing and maintaining market share.

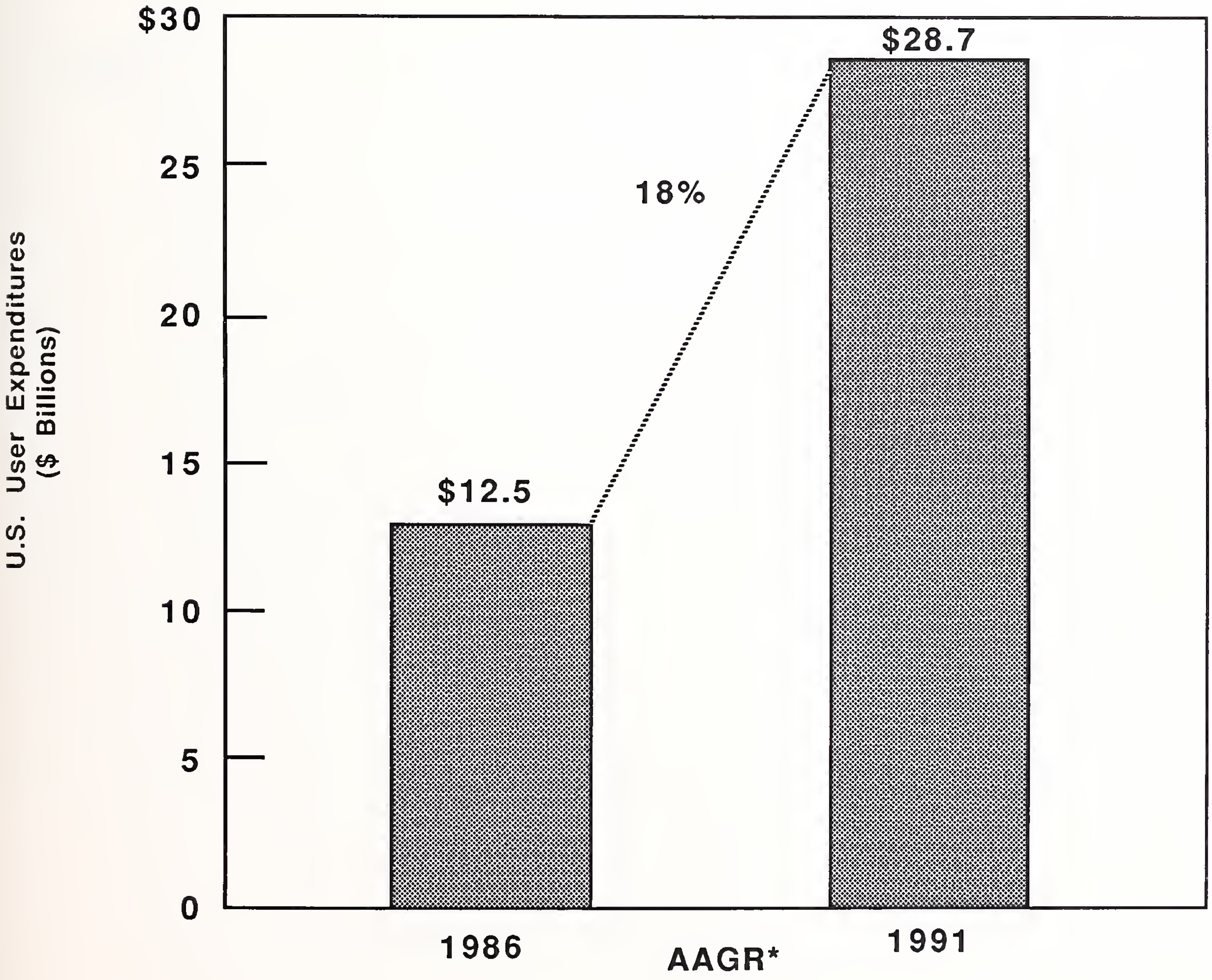
  - The demands for increased productivity and greater leverage of corporate assets, including equipment, personnel, and data.

2. MARKET LEADERS

- The leading vendors of professional services according to 1985 revenue are presented in Exhibit II-2. Interestingly, these top vendors account for only

EXHIBIT II-1

PROFESSIONAL SERVICES MARKET, 1986-1991



* A verage Annual Growth Rate

EXHIBIT II-2

U.S. INFORMATION SERVICES INDUSTRY PROFESSIONAL SERVICES LEADERS, 1985

RANK	VENDOR	USER EXPENDITURES ($ Millions)	MARKET SHARE (Percent)
1	International Business Machines (IBM)	$977	9%
2	Computer Sciences Corp.	609	6%
3	Arthur Andersen	400	4%
4	Peat, Marwick, Mitchell & Co.	220	2%
5	Burroughs/Systems Development Corp.	210	2%
6	General Motors/Electronic Data Systems	200	2%
7	Martin Marietta Data Systems	200	2%
8	Sperry Computer Corp.	200	2%
9	Bolt, Beranek & Newman	161	2%
10	Logicon	150	1%

32% of the total professional services market. And, less than 90 other vendors had professional services revenue greater than $10 million in 1985. A vast number of participants, over 1,400 with revenue greater than $200,000, share the majority of the revenue.

- This is a trend in the competitive structure that will not only continue, but likely be exacerbated, by recent changes in the market. Among the most prominent forces of this structural change is the increasing discrepancy between the dollar size and complexity of professional services assignments.

  - On the one hand are very large jobs, made that way by the technical complexities of the project or by a desire on the part of the user to create one large umbrella for a variety of planned professional services tasks.

  - On the other are generally much smaller jobs--in scope, if not in dollars--usually contracted by an MIS subdivision or a work unit elsewhere in the corporation. These jobs tend to be critical, one-shot jobs rather than the monolythic assigments discussed above.

- Vendors, of course, are posturing to meet the varying requirements of this job segmentation.

  - Some niche vendors are cultivating end-user organizations with "user comfort" services that range from hardware/software microcomputer selection consulting, to systems development work, to education and training that addresses the needs of the individual in a specific application.

  - Other vendors strategize that the increasing specialization requirements of professional services contracts means price increases in compensation for this additional capability and/or greater leverage of staff resources. (The idea, of course, is to transform a $400/day

programmer into a $1,000/day specialist.) Companies that have successfully established themselves as a recognized force in an industry or discipline include:

    - Auxton - communications.
    - Computer Task Group - banking and manufacturing.
    - Monchik Weber - finance.
    - Bolt, Beranek, Newman - networks.
    - Teknowledge - artificial intellignece.
    - Booz Allen Hamilton - office systems.

  - A third strategy being employed by the largest professional services vendors is the offering of full service, "one-stop shopping." By leveraging their financial resources to achieve economy-of-scale buying power; by developing a national, even international network of offices; and by developing partnering or teaming arrangements with other vendors, professional services firms are offering themselves as the provider or conduit for all the users' information services needs.

- Note must also be made of entry into the market by vendors who have not been known for their professional services capabilities.

  - Software, turnkey, and processing services vendors wanting to add value to their products have entered this market.

  - Vendors from non-information services industries that have been hurt by the economic slowdown. National Intergroup, a subsidiary of USX (formerly U.S. Steel) is a good example.

  - The "Big 8" accounting firms have increased their participation dramatically in the last two years.

  - And, in a similar vein, there have been several instances of a crossover from the commercial sector of professional services to the federal government sector and vice versa.

    - The commercial vendors are attracted by the large size and long-term of most government contracts. Government vendors usually enjoy a high rate of systems enhancements, extensions, and maintenance contract awards associated with initial awards. Many of these follow-on contracts are awarded on a sole-source, non-competitive basis, due to the vendors' unique experience and knowledge of the recently completed system.

    - The federal vendors find the potential for revenue stability of the commercial sector attractive as well as the freedom to price on a perceived value basis rather than on a regulated profit margin basis. And, in the commercial sector they avoid the long, drawn out, expensive bidding process that vendors frequently encounter in the federal sector.

B. PROFESSIONAL SERVICES SECTORS

- The professional services market is segmented by INPUT into the commercial and federal government sectors. These two categories, while they have many similarities, differ in buying characteristics, terms and conditions of business, and implementation demands.

1. COMMERCIAL

- The commercial sector represents approximately two-thirds of the total professional services market. An annual growth rate of 20% is expected, moving the sector from $9.3 billion in 1985 to $23.2 billion in 1991 (see Exhibit II-3).

    - The market size and growth rates for the vertical industries are presented in Exhibit II-4, and issues and trends in each market are discussed in depth in U.S. Information Services Vertical Markets, 1986-1991. Briefly, this exhibit suggests that the competitive requirements under the current deregulated environment as well as the need for greater productivity in producing and managing goods and services are propelling certain industries.

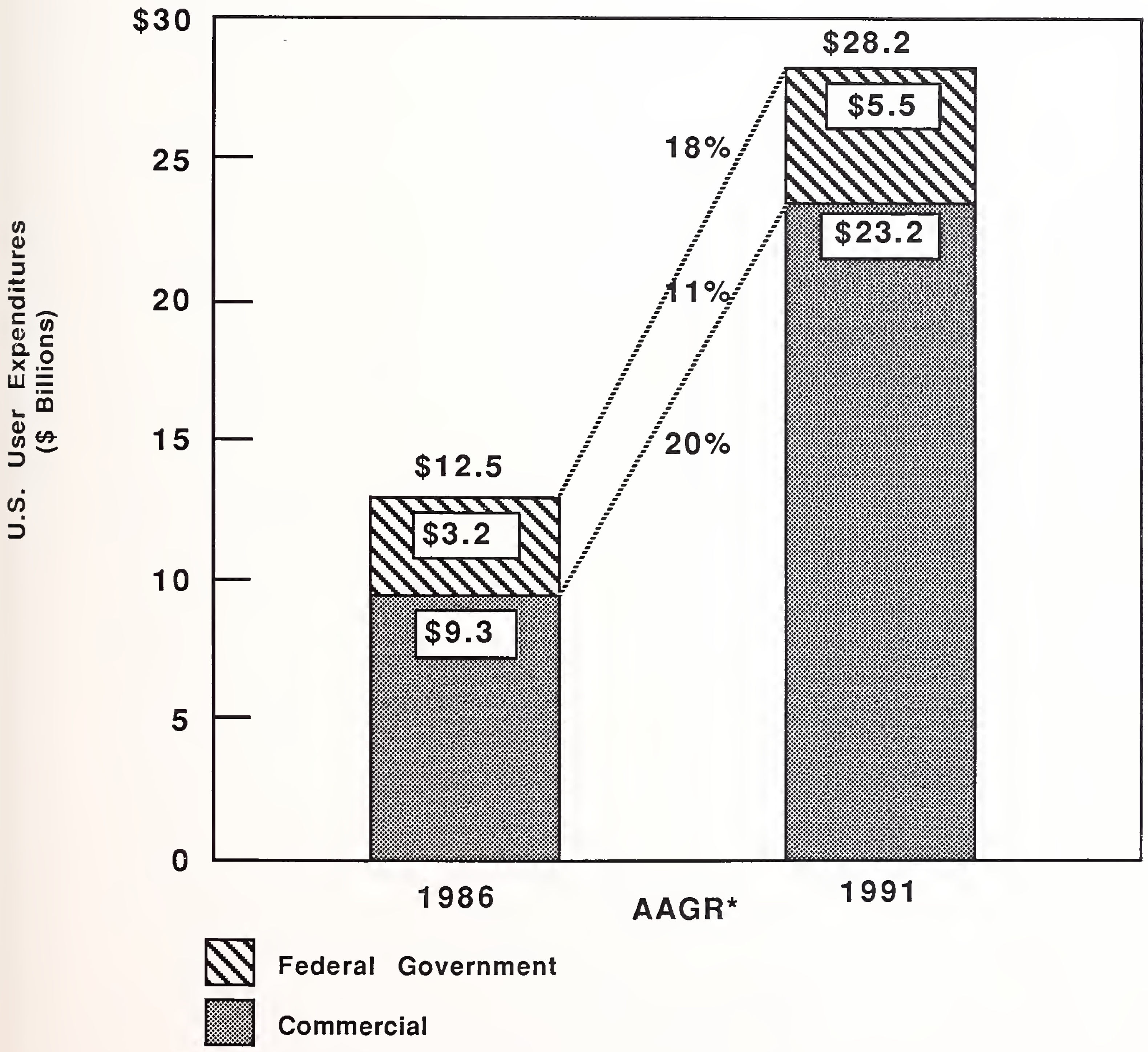
        - Telecommunications companies as well as banking and financial institutions lead in the drive to employ professional services firms to help in the development of automated systems that will establish their competitive edge.

        - The efficient production of goods, most notably in discrete and process manufacturing, is increasing expenditures for professional services as these firms seek productivity gains that will free them from the bonds of an expensive labor market in the U.S. and allow them to more ably compete with cheaper "offshore" producers of goods.

        - The medical and distribution industries require professional services to gain a greater control over the management of goods and services. This is especially true in the medical industry where the population in general has become more health conscious and where the growing number of senior citizens requires more medical attention under Medicare and Medicaid.

EXHIBIT II-3

PROFESSIONAL SERVICES MARKET SECTOR, 1986-1991



* Average Annual Growth Rate

EXHIBIT II-4

INDUSTRY PROFESSIONAL SERVICES MARKETS

INDUSTRY SECTOR	1986-1991 AAGR (Percent)	USER EXPENDITURES ($ Billions)	
		1986	1991
Discrete Manufacturing	22%	$2.1	$5.7
Process Manufacturing	22%	1.1	3.1
Transportation	21%	0.2	0.4
Utilities	9%	0.07	0.1
Telecommunications	23%	0.5	1.4
Distribution	18%	0.6	1.5
Banking and Finance	18%	1.5	3.5
Insurance	16%	0.9	1.9
Medical	22%	0.3	0.7
Education	9%	0.07	0.1
Services	19%	0.2	0.4
Federal Government	11%	3.2	5.5
State/Local Government	19%	1.6	3.8
Other	20%	0.3	0.7

*Totals may not equal high-level numbers due to rounding.

- The leading professional services vendors in the commercial sector in 1985 are listed in Exhibit II-5.

2. FEDERAL GOVERNMENT

- The U.S. government is the largest single user of information technology in the world. In 1986, over $16 billion will be spent on information technology. More than 120,000 federal workers currently manage over 20,000 medium- and large-scale computers and over 200,000 microcomputers.

- While federal agencies were among the first organizations to develop automated information and service delivery systems, by the late 1970s the federal government's leadership in computer applications was eroding. The government found itself dependent on outdated, cost-inefficient systems.

- The federal government has a need through the remainder of the decade to steadily improve the quality and quantity of data processing services. This must be done, in part, by overcoming the handicap of a rapidly aging equipment inventory. However, constraints applied by budget and personnel reductions make the goal that much harder to achieve.

- This need for outside contractors to support the professional services requirements of the federal government is evidenced by the increasing budget allocations, the need to expand federal DP capabilities through a modernization program, and the implementation of policies that freeze federal staffing levels and moves more information services support functions to the private sector.

- The federal government does not currently have the in-house staff required to support the quality and quantity of DP-related services required. Consequently, much of the work that would otherwise remain in-house will be contracted.

EXHIBIT II-5

U.S. INFORMATION SERVICES INDUSTRY PROFESSIONAL SERVICES LEADERS, 1985 COMMERCIAL SEGMENT

RANK	VENDOR	USER EXPENDITURES ($ Millions)	MARKET SHARE (Percent)
1	International Business Machines (IBM)	$684	6%
2	Arthur Andersen	296	4%
3	Computer Sciences Corp.	250	3%
4	Peat, Marwick, Mitchell & Co.	174	2%
5	McGraw-Hill	135	2%
6	AGS	117	2%
7	Computer Task Group	110	1%
8	Sterling Software	107	1%
9	Price Waterhouse	97	1%
10	DBA Systems	91	1%

- Much of the existing inventory of DP lacks flexibility, transaction speed, and memory to satisfy current and future requirements. Most of the current and planned acquisitions are aimed at upgrading or replacing these systems. An objective of the upgrades is a reduction in the long-term costs of maintenance and software development that has frequently resulted when information systems support requirements change without corresponding changes in systems capabilities.

a. Forecast

- Today, the government is in the midst of modernizing its computers and data processing systems. There will be a continuing demand for contracted services. The federal government professional services market will increase, INPUT estimates, from \$3.2 billion in 1986 to \$5.5 billion in 1991, an average annual growth rate of 11% (see Exhibit II-3). The need for professional services to support the government's rebuilding goals will continue to make federal government professional services the largest single externally-contracted information services segment of the federal market. (This forecast does exclude classified systems, particularly those in the intelligence community, and weapons systems.)

- The federal government professional services market will continue to be moderate as the government seeks to improve both the quality and quantity of automatic data processing supported services within the budget constraints imposed on it. Key among the forces that will sustain this market are:

  - A federal workforce heavily committed to maintaining existing software systems and inadequately staffed to develop much-needed new systems.

  - Pressure to reduce the federal budget deficit that make efficiency and innovation paramount.

  - Executive directives that now require federal agencies to utilize contractors rather than perform the work in-house if outside contracting proves to be cost-effective.

  - Technology, particularly in the area of microprocessors, that is advancing at a rate that requires the importation of expertise.

- There are negatives to the federal market, including the liabilities of contracting in a highly regulated and adversarial environment, the business risks associated with unique user requirements, and the increasing amount of competition.

  - The federal government professional services market has become increasingly competitive in the past few years. Small businesses, minority-owned businesses, and large aerospace vendors represent three types of new competitors who have come to this market from non-traditional quarters.

- Continuing federal budget pressures as well as this growing amount of competition has created a price-sensitive market where the winners are working with progressively narrower margins, more tightly controlled overhead, and reduced management structure. Among the practices with which vendors must contend are:

  - "Should cost" estimates that agencies typically establish before reviewing bids which include an independent review of the specifications, an estimate of the likely cost of the project, and/or a comparison of the cost of in-house and contractor performance of services in an attempt to determine if in-house development is, in fact, more expensive than commercial acquisition.

  - Congressional pressure for fixed-price contracts to avoid cost overruns.

- Most favored customer" regulations that require vendors to certify that the price quoted is the lowest price the vendor has received in the last six months and is at least 10% less than the vendor's comparable prices in commercial markets.

b. Leaders

- This market is dominated by systems houses and hardware firms. The firms require a broad range of in-house or consultant skills to meet systems integration and implementation requirements. Hardware firms are providing systems employing other company hardware that best meet client needs and price requirements (see Exhibit II-6).

- Competition in the federal government professional services arena is complicated by the continually changing pattern of vendor teams for different programs. Today's bidding partners are tomorrow's competitors, and vice versa.

C. PROFESSIONAL SERVICES DELIVERY MODES

I. OVERVIEW

- The structure of the professional services market by types of activities is presented in Exhibit II-7 and discussed briefly below.

a. Software Development

- Also called programming and analysis, this service develops software systems on a custom basis and includes:

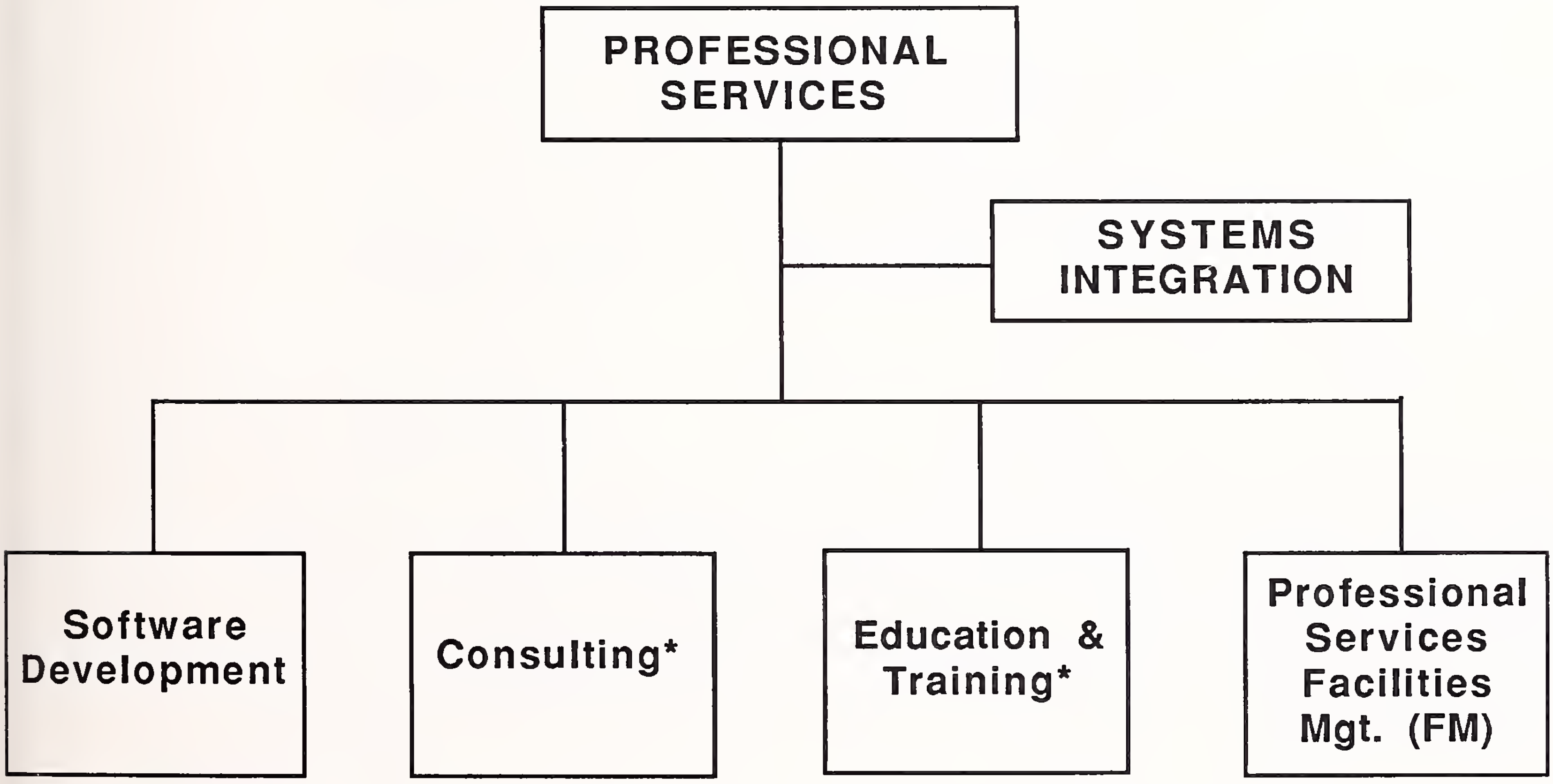
EXHIBIT II-6

U.S. INFORMATION SERVICES INDUSTRY PROFESSIONAL SERVICES LEADERS, 1985 FEDERAL GOVERNMENT SEGMENT

RANK	VENDOR	USER EXPENDITURES ($ Millions)	MARKET SHARE (Percent)
1	Computer Sciences Corp.	$339	13%
2	International Business Machines (IBM)	293	11%
3	Burroughs/Systems Development Corp.	147	5%
4	General Motors/Electronic Data Systems	140	5%
5	MITRE	140	5%
6	Sperry Computer Corp.	140	5%
7	Martin Marietta Data Systems	130	5%
8	Logicon	120	4%
9	Arthur Andersen	104	4%
10	Planning Research Corp.	85	3%

EXHIBIT II-7

PROFESSIONAL SERVICES MARKET STRUCTURE



- User Requirements Definition
- Systems Design
- Data Base Design
- Programming
- Testing
- System Modification
- Documentation
- Other

- Software Installation Planning
- Information Systems Audit
- Security Audit
- Personnel Planning
- Policies and Procedures Development (Other than related to Software Development)
- Other

- Computer Operations Training
- Management Training
- Analyst/Programmer Training
- Systems Usage Training
- Video Instruction (Related to Computer Topics)
- Other

- FM Using Customer-Owned Hardware

- Hardware and/or software system design.

- Custom software development.

- Modification of commercial software packages.

- Software testing of both custom and commercial packages.

- Software conversion.

- Maintenance of operating and applications software.

- Independent verification and validation of software packages prepared by other vendors.

b. Consulting

- Consulting ranges from special studies to the preparation of specifications of information systems resources required to meet specific needs. The service provided is management-oriented consulting, including feasibility studies, requirements analyses, systems audits, and technical direction and assistance consulting.

c. Education and Training

- Education and training of managers, professionals, and technicians involves the development of new skills, techniques, or knowledge in such areas as operations, programming, and software maintenance. A range of resources may be used including manuals and live instruction (video-based and computer-based).

d. Systems Integration

- Systems integration (SI) includes subsets of other professional services, packaged by the vendor in such a way that the contracted services have the appearance of a single-source vendor. SI services are generally associated with the design and implementation of DP/telecommunications systems, by one or more separately contracted vendors, rather than by a prime contractor typical in custom turnkey contracts. SI is usually associated with custom hardware/software projects, particularly with high risk efforts such as substantial systems upgrades and replacements.

- While the primary activity is a professional service, the complexity of the project may involve other information services for which the integrator, a prime contractor, or subcontractor receives revenue.

e. Facilities Management

- Facilities managemet includes the operation and maintenance of user owned or leased automatic data processing equipment including vendor operation, maintenance, and, occasionally, overall resource management.

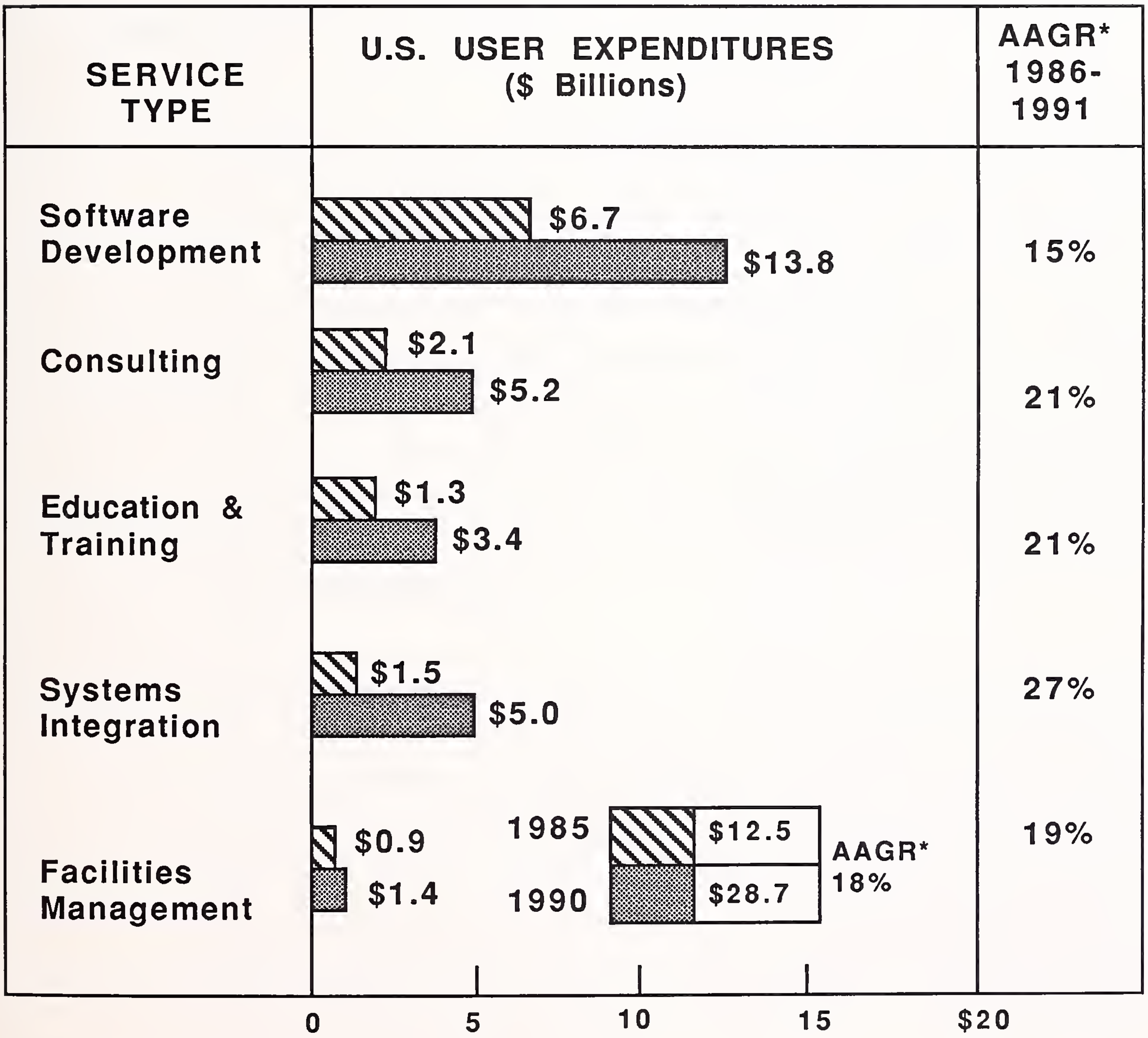
- Professional services facilities management differs from processing services facilities management in that professional services FM vendors have less or no direct management control of the facility. The computing equipment is owned or leased by the client, not the vendor. The vendor provides only the staff to operate, maintain, and manage the facility. FM may also involve site preparation and installation tasks.

2. FORECASTS

- The forecasts by professional service delivery mode are presented in Exhibit II-8 and discussed in detail below. Software development is by far the largest segment and will grow at an annual rate of 15%, just slightly below the overall

EXHIBIT II-8

PROFESSIONAL SERVICES MARKET BY SERVICE TYPE, 1986-1991



* Average Annual Growth Rate

market. Consulting and education and training will grow at a faster annual rate, but the combined user expenditures will still be less than one-half of software development in 1991.

a. Software Development

- The forecast for software development is presented in Exhibit II-9 and the industry leaders in Exhibit II-10.

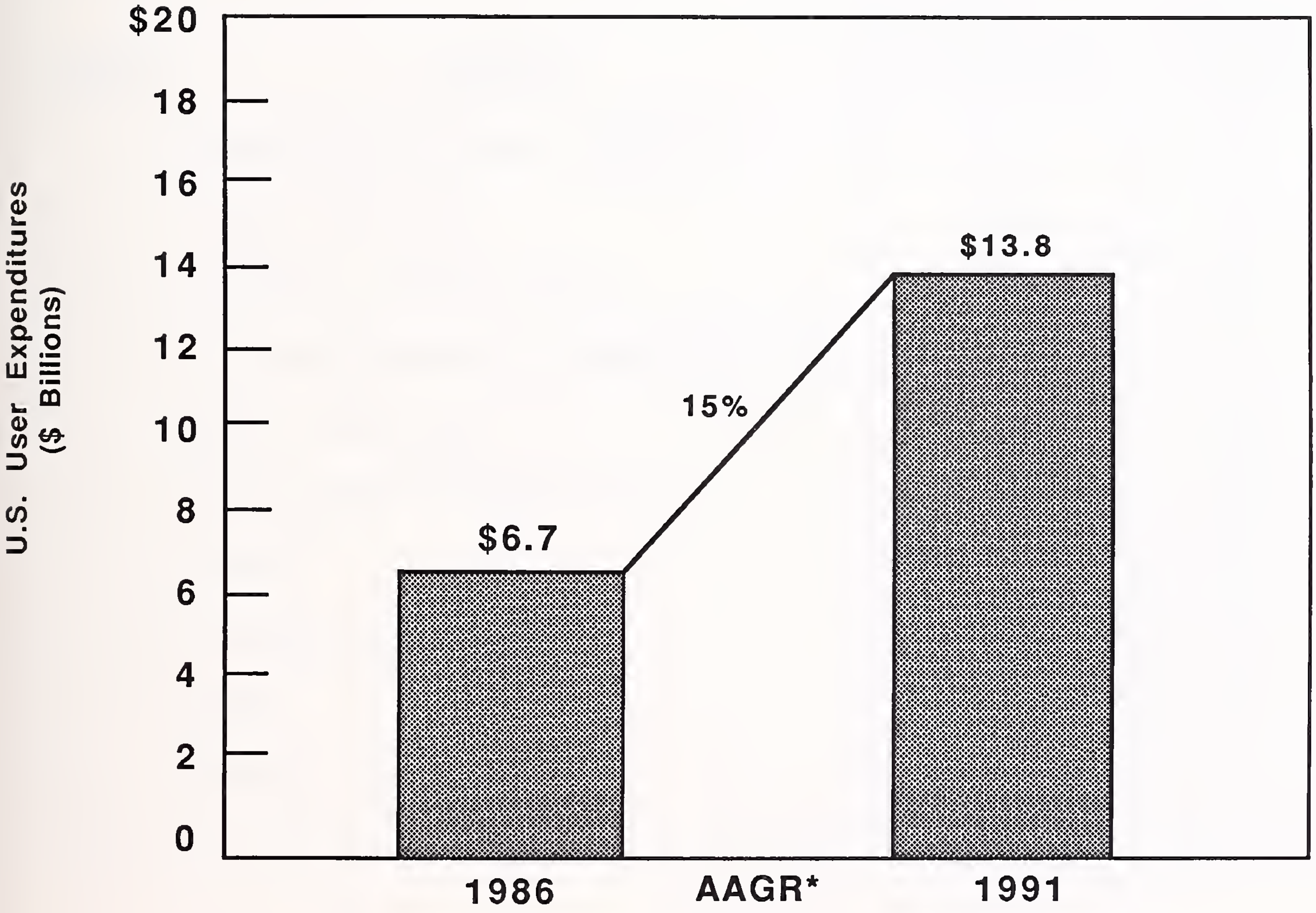
- In general, software development will continue to be a healthy mode for several reasons (see Exhibit II-11).

  - As discussed earlier, the user community has a lack of skilled in-house personnel to maintain existing systems and develop much needed new systems. In part, this lack of staff is due to the economic climate that has forced major reductions in the size of the staff that is maintained on a full-time basis. In some instances the staff may be present but unable to focus on new development because of demands on their time from an aging equipment inventory or from the lack of up-to-date technical skills required to implement new technologies. Regardless of the particular reason, vendors should find a large market for systems development work, either on a "body shop" basis or through out-of-house developed systems.

  - Comparison of the cost of in-house staff and contractor performance of professional services has always been a focal point in the decision to acquire professional services. In today's market this continues to be the case, but rising corporate overhead and the salary levels usually commanded by staff versed in newer technologies is indicating that contractors' fees are comparable to fully burdened in-house rates. The key, of course, is the notion of "fully burdened." Users must be made aware of the full costs of the in- house staff in any comparisons of internal versus external costs.

EXHIBIT II-9

SOFTWARE DEVELOPMENT MARKET, 1986-1991



* Average Annual Growth Rate

EXHIBIT II-10

U.S. INFORMATION SERVICES INDUSTRY PROFESSIONAL SERVICES LEADERS, 1985 SOFTWARE DEVELOPMENT SEGMENT

RANK	VENDOR	USER EXPENDITURES ($ Millions)	MARKET SHARE (Percent)
1	International Business Machines	$399	7%
2	Arthur Andersen	240	4%
3	Computer Sciences Corp.	158	3%
4	Burroughs/Systems Development Corp.	127	2%
5	Price Waterhouse	111	2%
6	Peat, Marwick, Mitchell & Co.	110	2%
7	MITRE	91	2%
8	Computer Task Group	89	1%
9	AGS	82	1%
10	Sterling Software	75	1%

EXHIBIT II-11

KEY ISSUES
SOFTWARE DEVELOPMENT

- Lack of Skilled In-House Resources
- Embedded Software Tools
- More Powerful and Flexible Software Packages
- "Buy and Tie" Approach
- Extensive Competition

- Growth will be stimulated by new software tools, either incorporated within applications packages or on a standalone basis. These tools promise to increase productivity of programmers and enhance the attractiveness of professional services offerings. Vendors are learning that a "tool box" concept of systems development that includes reusable code in the form of modules which can be generalized provides leverage from one project to another.

- There are offsetting influences in this market that vendors must address. Chief among these is the growing list of alternatives available to the user in the form of more powerful and flexible software packages that, in many instances, now include embedded tools that ease the efforts of modification and maintenance.

- With a plethora of more powerful software available to a user community suffering under slower growth, the "perceived" systems uniqueness that drove users to custom development may be shrinking. Users seem more willing to "buy and tie" software packages than in the recent past.

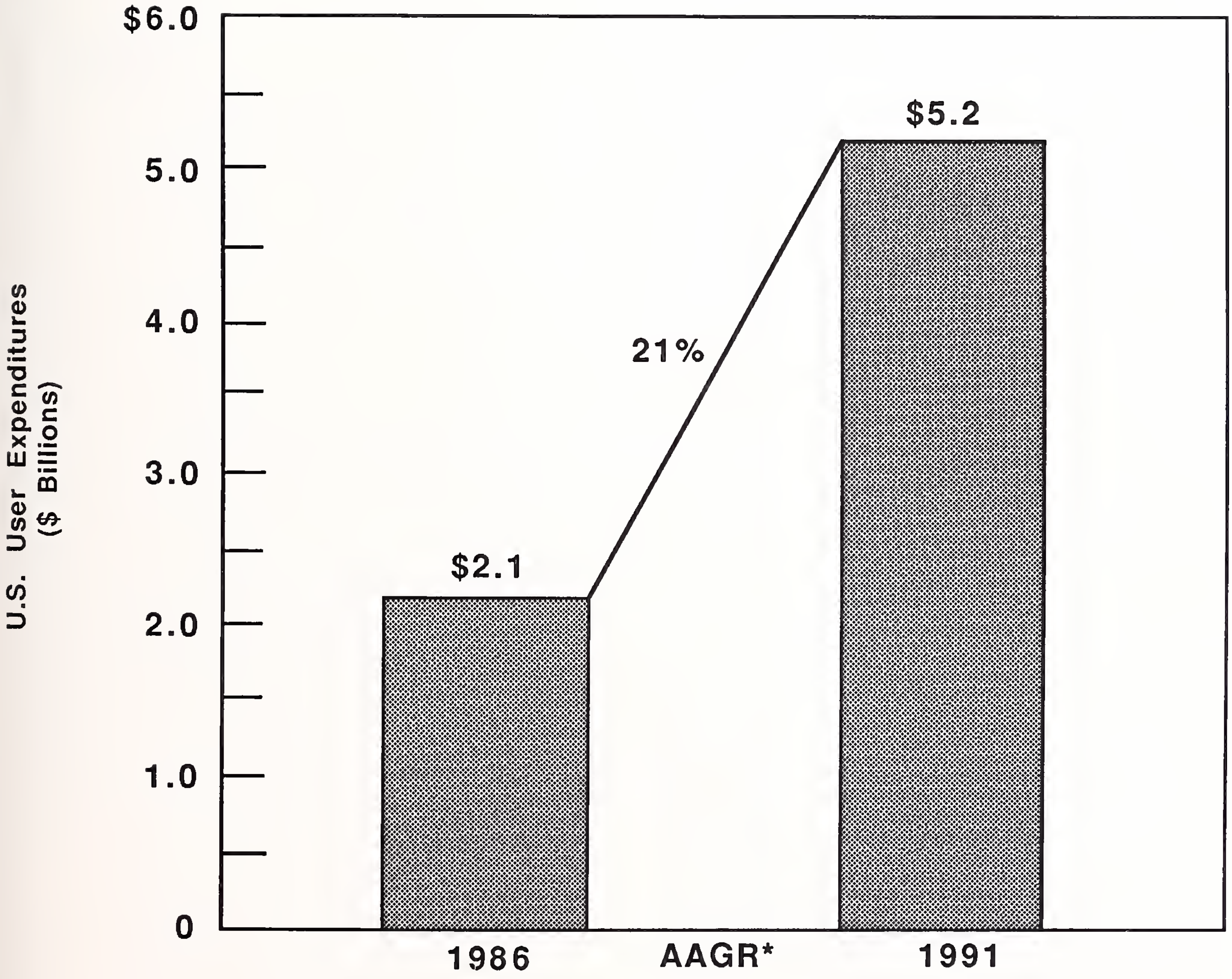
- Not only are software vendors expanding their offerings horizontally in their respective vertical markets, but they are adding their own professional services to maintain control of software and capture the modification/maintenance expenditures that have gone to professional services firms in the near past.

b. Consulting

- Consulting services is a smaller, but equally important part, of professional services vendors' offerings. INPUT estimates that user expenditures will increase from $2.1 billion in 1986 to $5.2 billion in 1991, an AAGR of 21% (see Exhibit II-12 for this forecast and Exhibit II-13 for the industry leaders in consulting).

EXHIBIT II-12

CONSULTING MARKET, 1986-1991



* Average Annual Growth Rate

EXHIBIT II-13

U.S. INFORMATION SERVICES INDUSTRY PROFESSIONAL SERVICES LEADERS, 1985 CONSULTING SEGMENT

RANK	VENDOR	USER EXPENDITURES ($ Millions)	MARKET SHARE (Percent)
1	International Business Machines	$342	19%
2	Arthur Andersen	100	6%
3	Computer Sciences Corp.	97	5%
4	Peat, Marwick, Mitchell & Co.	88	5%
5	McGraw-Hill	74	4%
6	Burroughs/Systems Development Corp.	63	4%
7	Digital Equipment Corp.	62	3%
8	Bolt, Beranek & Newman	60	3%
9	Sperry Computer Corp.	50	3%
10	MITRE	49	3%

- Exhibit II-14 lists some of the major issues and strategies of this delivery mode.

- A key impetus of growth is the corporate level of visibility now "enjoyed" by information systems. The level of capital investment, the criticality of these systems to the business, and the productivity gains through connectivity and compatability all serve to focus management's attention on information systems. These internal pressures, coupled with the availability of a wide variety of "solutions" requires that users seek expert counsel to keep current on near- and long-term developments in the multitude of disciplines related to information systems.

- Professional services vendors are in a unique position to provide management with an objective, up-to-date assessment of where the company is, where they should be going, and how to get there efficiently.

- The concern is so large and the impact of systems so diffuse that many non-professional services vendors have become involved in systems consulting. Traditional information services vendors may need to establish their credentials from both a technical capabilities and vertical industry expertise position to secure business.

c. Education and Training

- Education and training is one of those markets which shows tremendous potential but which is difficult to capture on any large share basis. U.S. businesses spent an estimated $40 billion to educate and train their personnel in 1985, but there are few vendors that could claim any more than a single-digit share of that amount.

- The portion spent on education and training in the information services industry will amount to $1.3 billion in 1986. INPUT forecasts that this will

EXHIBIT II-14

KEY ISSUES
CONSULTING

- Corporate Visibility of DP
- Plathors of "Solutions"
- Competition from Non DP-Oriented Vendors

grow at an annual rate of 21% and reach $3.4 billion in 1991 (see Exhibit II-15).

- Very few professional services vendors have no education and training offering, but what is offered by the majority of vendors is of an ancillary, add-on, customer service type. The user expenditures received by the major vendors of education and training are depicted in Exhibit II-16.

- A key force in this segment of the market is the ubiquity of computing within companies. The growing number of users of automated information systems has increased education and training needs and refocused it at the work unit level. While professional services vendors will have a more difficult time finding key contacts at this work unit level, without question they must address this level and, in the process, should find pockets of potential.

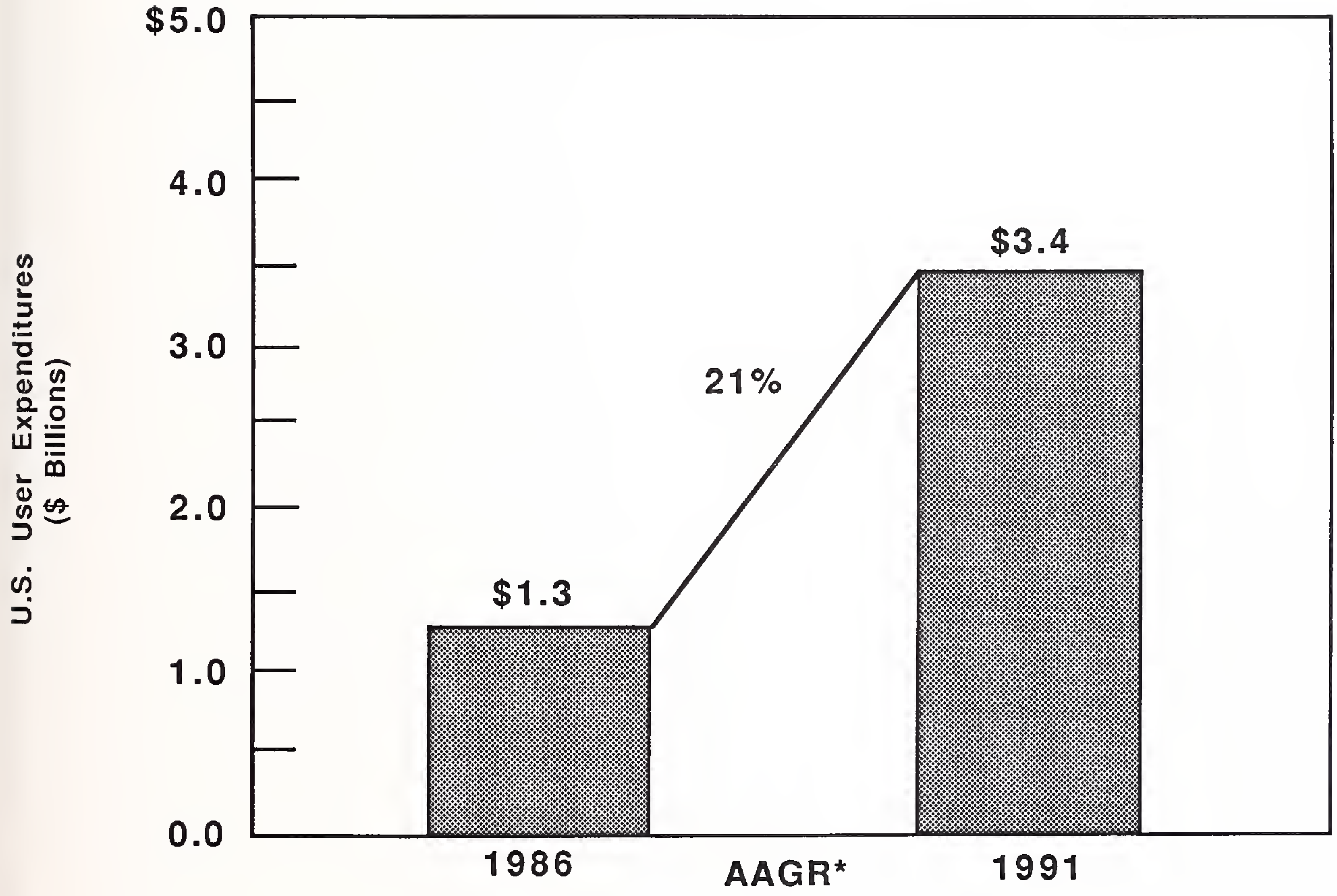
- A strong opportunity exists for training personnel on newly evolving, complex software development tools, hardware, and telecommunications. If companies are going to have any hope of remaining technologically current, and if they are going to attract and retain personnel, they must offer up-to-date training.

- As mentioned earlier, however, it is extremely difficult to identify a concentrated enough group to make a profitable standalone education and training offering, especially for live- or video-based instruction. The unique needs of companies and individuals within those companies makes the identification of a critical mass very difficult. Without that mass, it is generally not profitable for vendors who add-on education and training to provide the same packages on a standalone basis.

- Even when an attractive mass is identified, professional services vendors usually find it difficult to keep materials current. It is for this reason that computer-based instruction, an ideal medium for large, diffuse groups that need to learn a standard procedure or technique, has met little success. Technical advances and company changes makes current instruction in any form other than "live" very difficult.

EXHIBIT II-15

CONSULTING MARKET, 1986-1991



* Average Annual Growth Rate

EXHIBIT II-16

U.S. INFORMATION SERVICES INDUSTRY PROFESSIONAL SERVICES LEADERS, 1985 EDUCATION AND TRAINING SEGMENT

RANK	VENDOR	USER EXPENDITURES ($ Millions)	MARKET SHARE (Percent)
1	International Business Machines	$147	13%
2	McGraw-Hill	61	5%
3	Arthur Andersen	60	5%
4	Deltak	60	5%
5	Logicon	37	3%
6	Computer Sciences Corp.	30	3%
7	ASI	30	3%
8	Computer Horizons	26	2%
9	Sperry Computer Corp.	25	2%
10	Peat, Marwick, Mitchell & Co.	22	2%

- For all of these reasons, the perceived value of education outside of a specific application is quite low. Users have had too many disappointing experiences with questionable content and poor presentations to be willing to pay any kind of a premium.

- In short, education and training, although growing at a rapid rate, is only for those specialized vendors who understand and can produce quailty, current educational courseware in a price-sensitive market.

d. Systems Integration

- Systems integration, added to INPUT's professional services market as a separate delivery mode for the first time in 1986, represents one of the most exciting new areas of professional services. While the federal government has sought integration capabilities from vendors for some time, the commercial sector is just now realizing the benefits of doing so.

- This segment should grow at an annual rate of 27% from the 1986 level of $1.5 billion to $5.0 billion in 1991 (see Exhibit II-18).

- Leaders in this segment are primarily vendors with a history of federal government contracting (see Exhibit II-19). These vendors are now porting these unique skills to the commercial sector and competing with traditional commercial vendors who are developing these skills to meet emerging needs involved with large, complex projects.

- The complexities of some development projects simply demands a team of vendors with recognized expertise in a multitude of disciplines. No single vendor currently has all of the capabilities required in these types of projects nor does any vendor have the buying power that comes from economies of scale that is also frequently required.

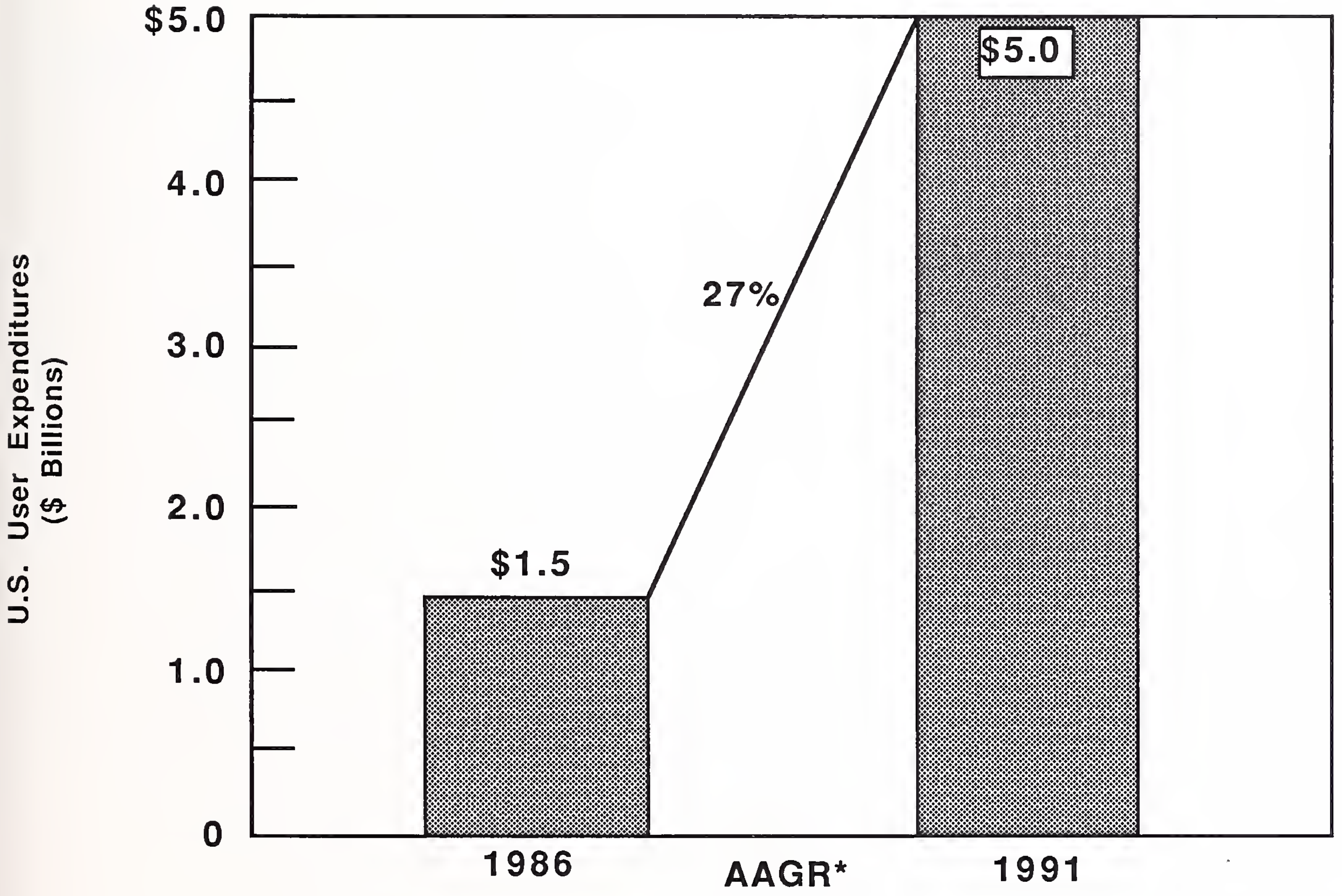
EXHIBIT III-17

KEY ISSUES
EDUCATION AND TRAINING

- Ubiquity of Automated Information Systems
- Rapid Technical Changes
- Lack of a Critical Mass
- Low Perceived Value

EXHIBIT II-18

SYSTEMS INTEGRATION MARKET, 1986-1991



* A verage Annual Growth Rate

EXHIBIT II-19

U.S. INFORMATION SERVICES INDUSTRY PROFESSIONAL SERVICES LEADERS, 1985 SYSTEMS INTEGRATION SEGMENT

RANK	VENDOR	USER EXPENDITURES ($ Millions)	MARKET SHARE (Percent)
1	Computer Sciences Corp.	$100	11%
2	International Business Machines	90	10%
3	General Motors/Electronic Data Systems	75	8%
4	Sperry Computer Corp.	75	8%
5	Bolt, Beranek & Newman	60	7%
6	Science Applications International	60	7%
7	Martin Marietta Data Systems	50	5%
8	Planning Research Corp.	35	4%

- From the users' perspective the driving forces (see Exhibit II-20) are the need to consolidate a variety of applications that are now only loosely connected. For example, companies are realizing a need to integrate core accounting functions with payroll, inventory management, and various accounting modules, all under the umbrella of a central data base management system.

- Also, this integration must take place by sorting out a myriad of alternatives and a multi-vendor environment that frequently prohibits straightforward interfaces.

- There are problems to be overcome before the full potential of systems integration will be realized by vendors.

  - Systems integration may require a company to turn over control of the entire information systems to the integrator. Not only is this risky for the user on an operational basis, but also in the sense that the expertise for the systems remains in the hands of the vendor, not the user.

  - There is also the concern that the commercial market does not have the adversarial mentality that may be required for systems integration. In the federal government where the bidding and implementation processes are so highly regulated, laws exist to protect federal agencies from the results of unsuccessful efforts. And agencies, as we all know from reading the headlines, are not afraid to take the vendor to court to settle differences. In the commercial side, however, these laws do not exist and, even if they did, it is unlikely that a company would desire to suffer the bad press that might result from a suit.

  - Companies also face the political risks associated with the elimination of jobs that seem to be inevitable. The tremendous cost of a large integration project can only be offset by the elimination of jobs. If these are union jobs, the problem only becomes compounded.

EXHIBIT II-20

KEY ISSUES
SYSTEMS INTEGRATION

- Consolidation of Applications
- Miriad of Alternatives
- Multi-Vendor Environment
- Account Control
- Lack of Adverserial Mentality
- Political Factors

- The chief concern among vendor providers is the lack of experience they have had in systems integration. Some efforts may call for a level of expertise in complex operating environments, for example, that few independent vendors have. While most vendors feel that it is a benefit to be independent of a particular brand of hardware for the sake of objectivity, these vendors realize that this independence requires additional learning that may, in fact, not be readily available. The answer may be multiple relationships among independent vendors and hardware manufacturers.

e. Facilities Management

- The client-owned contractor-operated market of facilities management will experience only moderate growth in user expenditures. As depicted in Exhibit II-21, INPUT forecasts that this market will grow from $0.9 billion in 1986 to $1.4 billion in 1991, an AAGR of just 9%.

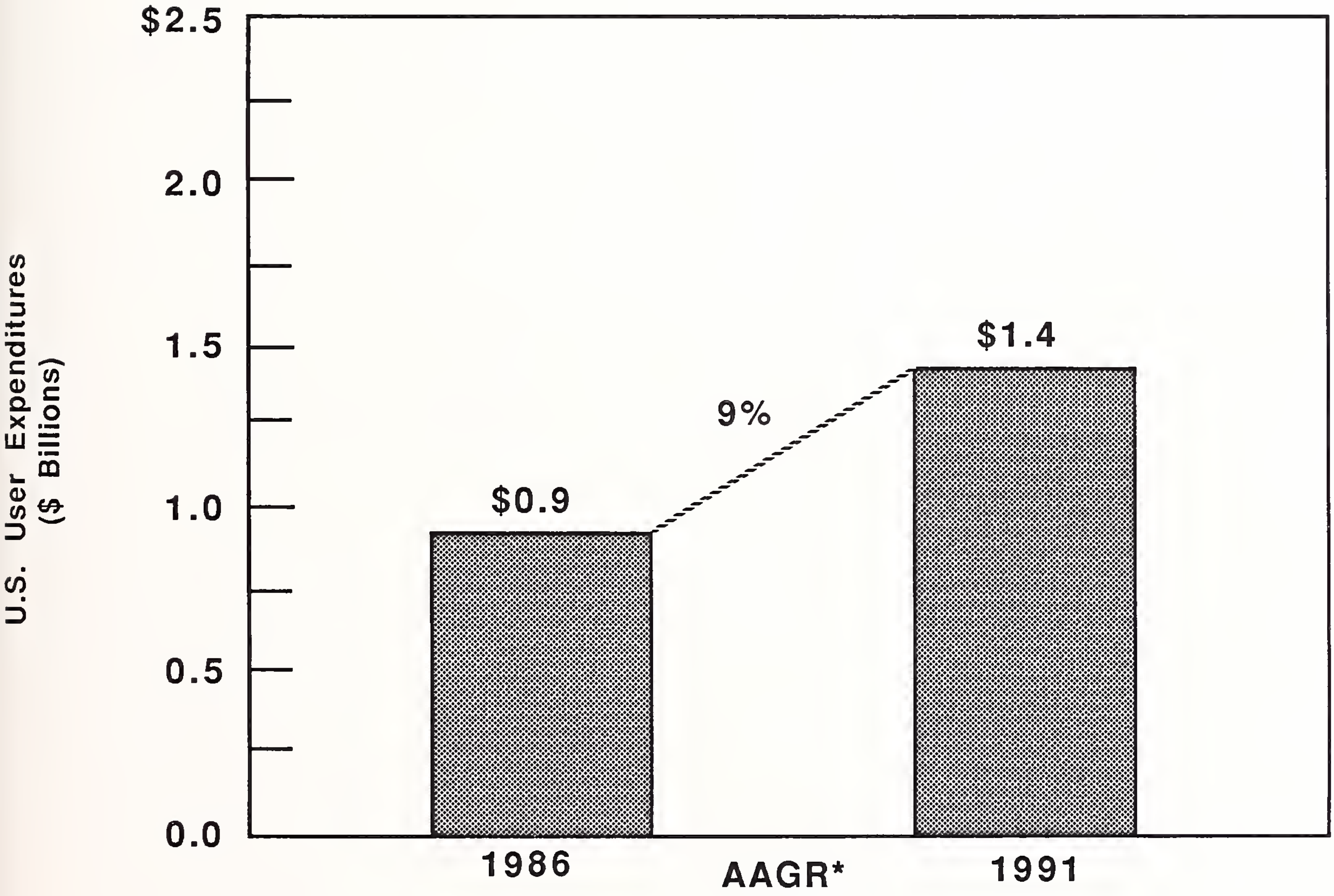
- Much of these expenditures are from the federal government sector where outside contractors are frequently required to run government-owned data centers for agencies experiencing cutbacks in staff as a result of deficit control measures. The facilities management leaders, as well, represent federal government contractors in this segment (see Exhibit II-22).

- While the lack of a skilled in-house staff available to run sophisticated systems will remain a positive force (see Exhibit II-23), this will be mitigated, in part, by increases in training of available staff that will allow this in-house group to operate and maintain these systems.

- As vendors become more capable of financing the capital investment, vendors will offer and clients will accept vendor-owned facilities management, classified by INPUT under the processing/network services delivery mode.

EXHIBIT II-21

FACILITIES MANAGEMENT MARKET, 1986-1991



* Average Annual Growth Rate

EXHIBIT II-22

U.S. INFORMATION SERVICES INDUSTRY PROFESSIONAL SERVICES LEADERS, 1985 FACILITIES MANAGEMENT SEGMENT

RANK	VENDOR	USER EXPENDITURES ($ Millions)	MARKET SHARE (Percent)
1	Computer Sciences Corp.	$224	31%
2	Martin Marietta Data Systems	85	12%
3	General Motors/Electronic Data Systems	50	6%
4	Dynamics Research	45	6%
5	Lockheed/LEMSCO	43	6%
6	Benedix	41	4%
7	Systems & Computer Technology	31	4%
8	Dynalectron	29	4%
9	Telos Corp.	29	4%
10	Planning Research Corp.	26	4%

EXHIBIT II-23

KEY ISSUES
FACILITIES MANAGEMENT

- Sophisticated Systems
- Lack of Skilled In-House Staff
- More to Vendor-Owned/Vendor Operated FM

III PROFESSIONAL SERVICES MARKET OPPORTUNITIES

A. GENERAL APPLICATION TARGETS

- Although individual companies have unique requirements that specify different application needs, there are some general application targets that vendors may wish to explore (see Exhibit III-1).
  - Major opportunities exist for applications that provide new management information systems that represent upgrades or expansions of capabilities relating to day-to-day operations.
  - Data management capabilities and data base management systems will become particularly important as users attempt to organize their information resources and establish a more productive operating environment.
  - Office automation applications should be fruitful for vendors who offer solutions for the integration of incompatible hardware and meet the need for increased end-user support. Textual data bases and other document handling routines, when combined with digital image processing, could be key factors in establishing a distinct capability in the area of electronic publishing. It is the office automation arena, incidentally, that systems integration approaches seem particularly applicable as a means of dealing with the use of multiple technologies.

EXHIBIT III-1

MARKET OPPORTUNITIES

APPLICATIONS

Information Systems Upgrades

Data Management

Office Automation

Human Resources

Super Computers

INDUSTRIES

Banking and Finance

Manufacturing

Federal Government

- Human resources also appears to offer a strong potential. The "cafeteria style" of human resources fostered by the desire to provide more services while containing costs has put development in this area on the users' priority list. While this would seem to be another area where the integration of human resources and an umbrella data base would appear to be a reasonable approach, the cost of doing so may fall outside the bounds of the "must have" category and be treated as a discretionary item.

- A growing user comfort with supercomputer-based applications suggests that expertise in this discipline may result in a significant payoff. There does continue to be confusion over the proper role of supercomputers. While vendors have approached transaction-intensive businesses with supercomputer applications, the more logical place may be in situations requiring large-scale modeling capabilities. Control Data and Boeing Computer Services have both had success in these environments, although most of the applications have been in the federal government sector.

- A particular concern surrounding these applications is software management. With a significant amount of every data processing dollar spent on maintenance of existing software systems, there is a need to improve software maintenance tools to reduce these costs.

B. INDUSTRY TARGETS

- The banking and finance industry, as mentioned earlier, continues to show promise. Businesses in this industry have needs for applications systems such as demand deposit accounting, loan application processing, customer information files, and the like.

- In the manufacturing arena, interest continues to include process control applications and materials management.

- The federal government sector has recently been acquiring professional services for such target applications as administrative and logistics systems, financial management and budget control, and scientific applications that include space exploration, energy, and weapons development.

IV RECOMMENDATIONS AND CONCLUSIONS

- The process of selecting a vendor for a professional services contract is one of professional evaluation. The bid selection criteria, while varying from client to client, usually involves:

  - Proposed technical solution.

  - Vendor reputation for providing satisfactory services.

  - Corporate commitment to providing support.

  - Risk containment procedures, including reporting schemes and progress report.

  - Cost.

A. GENERAL CONSIDERATIONS

- While many of the above selection criteria specifically imply the type of action required for success and will not be elaborated upon, others may need additional commentary (see Exhibit IV-1).

EXHIBIT IV-1

RECOMMENDATIONS

- Emphasize Support
- Firm Up Project Management
- Gather Prospect Intelligence
- Know the Risks
- Understand the Client
- Develop Capabilities

- Vendors should emphasize their support capabilities and performance in their bids. Many service vendors cannot provide evidence of customer satisfaction since they do not carry out systematic surveys in this area.

- Economic pressures and the growing amount of competition is creating a price-sensitive market where the winners will be working with progressively narrower margins, more tightly controlled overhead, and reduced management structure.

- Bid development now requires in-depth pre-solicitation intelligence and early executive management involvement. Companies that fail to accurately assess their prospect find themselves wasting scarce proposal dollars in expensive bidding failures.

B. SPECIFIC RECOMMENDATIONS

I. KNOW THE RISKS INVOLVED

- Vendors provide professional services to clients under a variety of contract types:

  - Cost-plus contracts provide for vendor costs to be paid and a fee added that is either negotiated (cost-plus fixed-fee) or based upon the performance of the contractor in satisfying the contract requirements (cost-plus award fee). Cost-plus contracts effectively regulate the margin of profit allowed, but clearly places the risk with the client.

  - Fixed-price contracts commit vendors to perform and complete a contract at a predetermined price ceiling. To a significant extent, the profitability associated with a fixed-price contract is dependent upon the vendor's ability to accurately appraise, in advance, the costs of

providing the services specified. Managing fixed-price contracts successfully requires an extremely well written and detailed statement of work and project scope. The risk of completion is placed squarely on the vendor.

  - Level of effort or time and materials contracts provide for an hourly billing plus reimbursement for out-of-pocket expenses required to satisfy the terms of the contract. In some instances, vendors are required to combine their contract with a "not to exceed" clause that essentially imposes cost ceilings.

- While vendors generally prefer cost-plus or level of effort contracts without cost ceilings over fixed price because those contracts minimize the financial risk to the vendor, users do prefer fixed-price. Vendors should identify the conditions under which they can accept fixed-price contracts, since clients, especially federal agencies, have shown a clear preference for fixed-price. This may mean that vendors must find and implement methods of pricing and contract managment that allow them to minimize the risks of performance on a fixed-price basis.

- The maturity of some portions of the professional services market, especially code conversion and facilities management, narrows the allowable cost envelope for successful contract bidders. Incumbent vendors, especially in the federal government, cannot assume that cost and profit recovery will come automatically in recompetition of the current support services contract.

  - However, some activites are inherently less risky. Operation and maintenance, for example, represents a market that, while not always as attractive as developing state-of-the-art systems, is less risky and often financially more rewarding.

- Just as clients employ contractors to overcome personnel shortages, vendors may also face labor pool shortages in specific hardware and software systems

and/or in particular geographic areas. Failure to resolve these shortages in the pre-bid stage can be expensive in both overhead and management costs after award.

2. UNDERSTAND THE CLIENT

- Vendors should increase their intelligence-gathering activities and develop a thorough understanding of the client's needs and objectives that goes far beyond the stated contract requirements. This must be done during the bid development process but should also be a standard practice performed without regard to specific opportunities.

3. DEVELOP CAPABILITIES

- With professional services vendors continuing to employ a strategy of niche development, it behooves all vendors to reassess their strategies for competing with this developing expertise. For some vendors this assessment should identify their strengths and allow them to plan for, first, strengthening these assets and then, second, covering those that can be easily developed.

- In the latter case, the idea of strategic partnering is frequently employed and must be employed by systems integrators.

    - With few individual vendors able to meet the demands required in wide spread, multi-dimensional systems, and, even fewer with the R&D capability to advance these capabilities in newer technologies while spending to capture and successfully complete assignments, many vendors have sought partners in other information services providers.

    - This concept suggests that the unique requirements of a targeted opportunity be used to guide the vendor's selection of products, services, and capabilities needed to satisfy these requirements. Whether the products/services are developed in-house or licensed or

purchased from another vendor, the goal of strategic partnering is to satisfy the user requirements in a manner that offers the user the appearance of the vendor as a single source of service for a wide spectrum of requirements, including post-development services such as training, documentation, maintenance, and on-going support.

  - There are negatives associated with partnering.

    - Partnering cannot compensate for fundamental vendor weaknesses and may, in fact, accentuate them by creating mutual dependencies.

    - Partnering in a reactive mode clouds the dynamics that are vital to the development of a healthy sharing relationship.

    - Partnering may call for teaming with vendors who otherwise would be competitors. This may violate business instinct.

C. CONCLUSIONS

- Although the economic climate has had a negative impact on the information services industry, the professional services segment appears headed for a steady, attractive growth cycle.

- Individual vendor growth is not assured, and the increasing amount of competition, both from within and outside the industry, only serves to reinforce the need for an on-going program of market assessment, company capability assessment, and the resulting congruency analysis. Key to this assessment is an objective, fact-based answer to the following questions:

  - Can we (the vendor) identify an attractive market segment?

- Can we capture a meaningful share of that segment?

- Will the costs of doing so be worth the effort?

EXHIBIT V-B-12

PROFESSIONAL SERVICES MARKET BY INDUSTRY, 1986-1991

SEGMENTATION	($M) 1985	85-86 GROWTH	($M) 1986	($M) 1987	($M) 1988	($M) 1989	($M) 1990	($M) 1991	AAGR 86-91
INDUSTRY-SPECIFIC									
DISCRETE MANUFACTURING	1695	23%	2089	2712	3327	4071	4764	5688	22%
PROCESS MANUFACTURING	932	19%	1109	1259	1427	1836	2432	3055	22%
TRANSPORTATION	137	15%	157	184	215	256	305	407	21%
UTILITIES	67	10%	74	83	90	96	103	112	9%
TELECOMMUNICATIONS	392	25%	489	611	764	955	1193	1392	23%
DISTRIBUTION	536	17%	625	735	945	1140	1290	1460	18%
BANKING AND FINANCE	1250	19%	1490	1773	2110	2511	2988	3456	18%
INSURANCE	811	16%	940	1082	1244	1431	1645	1950	16%
MEDICAL	220	21%	266	324	399	494	598	724	22%
EDUCATION	65	8%	70	77	84	92	101	110	9%
SERVICES	140	16%	163	189	219	258	302	397	19%
FEDERAL GOVERNMENT	2764	17%	3230	3574	3989	4414	4917	5536	11%
STATE AND LOCAL GOVERNMENT	1342	17%	1575	1764	2099	2498	2973	3775	19%
OTHER INDUSTRY-SPECIFIC	220	20%	265	331	401	490	570	673	20%
GRAND TOTAL	10571	19%	12542	14698	17313	20542	24181	28735	18%

EXHIBIT V-B-13

PROFESSIONAL SERVICES MARKET BY TYPE OF SERVICE, 1986-1991

SEGMENTATION	($M) 1985	85-86 GROWTH	($M) 1986	($M) 1987	($M) 1988	($M) 1989	($M) 1990	($M) 1991	AAGR 86-91
FEDERAL GOVERNMENT PROFESSIONAL SERVICES									
SOFTWARE DEVELOPMENT	850	13%	961	1078	1220	1285	1443	1652	11%
CONSULTING	305	16%	355	370	390	430	450	480	6%
EDUCATION & TRAINING	250	8%	270	300	330	370	400	410	9%
SYSTEMS INTEGRATION	789	15%	904	1026	1189	1399	1634	1924	16%
FACILITIES MANAGEMENT	570	30%	740	800	860	930	990	1070	8%
SUB-TOTAL	2764	17%	3230	3574	3989	4414	4917	5536	11%
COMMERCIAL PROFESSIONAL SERVICES									
SOFTWARE DEVELOPMENT	4964	16%	5768	6690	7760	9000	10445	12099	16%
CONSULTING	1420	20%	1709	2100	2585	3180	3900	4765	23%
EDUCATION & TRAINING	854	23%	1052	1290	1590	1955	2405	2970	23%
SYSTEMS INTEGRATION	409	49%	608	853	1179	1760	2248	3055	38%
FACILITIES MANAGEMENT	160	9%	175	191	210	233	266	310	12%
SUB-TOTAL	7807	19%	9312	11124	13324	16128	19264	23199	20%
GRAND TOTAL PROFESSIONAL SERVICES									
SOFTWARE DEVELOPMENT	5814	16%	6729	7768	8980	10285	11888	13751	15%
CONSULTING	1725	20%	2064	2470	2975	3610	4350	5245	21%
EDUCATION & TRAINING	1104	20%	1322	1590	1920	2325	2805	3380	21%
SYSTEMS INTEGRATION	1198	26%	1512	1879	2368	3159	3882	4979	27%
FACILITIES MANAGEMENT	730	25%	915	991	1070	1163	1256	1380	9%
GRAND TOTAL	10571	19%	12542	14698	17313	20542	24181	28735	18%

II OVERVIEW OF COMMERCIAL SYSTEMS INTEGRATION MARKET, 1986-1991

EXHIBIT 1

PROJECT CHARACTERISTICS

- Multi-Year
- Substantial Customized Design and Software
- Complex Multidisciplinary Information Systems Requirements
- Substantial Risk Exposure
- Teaming/Partnerships

EXHIBIT 2

CSI DRIVING FORCES

- Integration
    - Data, Text, Voice, Image ProcessingSystems; Better Use of Existing Systems
- Competition
    - Increased Foreign and Domestic Pressure in All Industries on Quality and Cost
- Complexity
    - Incompatible Hardware, Software, Network Needs; Lack of In-house Skills
- Growth Potential
    - 1986 Expenditures: $1,080 Million
    - 1991 Expenditures: $5,400 Million
- Strategic Significance
    - Whoever Controls the Project Controls Downstream Spending; Multi-year Contracts the Norm
- Alliance Formation
    - Partnerships Forming that May Last Ten Years; once Formed, May Be Difficult to Break/Compete With

EXHIBIT 3

IN-HOUSE GROUPS: THE REAL COMPETITION

- Not a Marketforce, but the Main Obstacle to Getting Projects Completed on Time
- Not Cooperative; Cross-Divisional Antagonisms
- Strengths: Knowledge of Historical, Political and Operational Realities
- Weaknesses: Can't Rise above Today's Problems to Visualize New Ways of Doing Things

EXHIBIT 4

CSI TRENDS

- Users Going Outside for More and More Projects: 1986 - 21%, 1991 - 39%

- Strategic Alliances Mandatory - No Single Vendor, Including IBM, Can Cover the Spectrum

- Companies Developing Industry Sector-Specific, Complex Project Expertise/Image: IBM - Banking, Insurance; Arthur Andersen - Manufacturing, Networks; Bechtel - Utilities, Energy

EXHIBIT 5

DISTINGUISH BETWEEN PROJECT VALUE, CONTRACTS AND EXPENDITURES

ACTIVITY	$ BILLIONS		AAGR (Percent)
	1986	1991	
Major Projects Committed	$8.1	$21.3	21%
External Contracts Signed (Sales)	$1.7	$8.3	37%
User Expenditures in Year	$1.0	$5.4	40%

EXHIBIT 6

COMPETITOR GROUP RANKING

RANK	GROUP
1	Professional Services
2	Hardware Manufacturers
3	Aerospace (Divisions)
4	Engineering and Construction
5	Management Consultants
6	Communications Vendors
7	In-House Groups

EXHIBIT 7

COMMERCIAL SYSTEMS INTEGRATION USER EXPENDITURES

BENEFICIARY	$ MILLIONS		AAGR (Percent)
	1986	1991	
Professional Services	$605	$3,055	38%
Software Products	$63	$320	38%
Computer Systems	$323	$1,510	36%
Communications Systems	$77	$435	41%
Other	$12	$80	45%

EXHIBIT 8

BEST INDUSTRY TARGETS

	$ MILLIONS		AAGR (Percent)
	1986	1991	
Discrete Manufacturing	$320	$1,320	33%
Banking and Finance	$115	$785	47%
Insurance	$100	$730	49%
Distribution	$70	$535	50%

EXHIBIT 9

"POWER PLAYERS"

RANK	COMPANY
1	IBM Federal Division
2	Arthur Andersen
3	EDS
4	TRW
5	BBN
6	Bechtel
7	Hughes

HOW DO WE KNOW COMMERCIAL SYSTEMS INTEGRATION (CSI) IS FOR REAL?

- A market can be created by (among other things) these driving forces:
  - Real end-user requirements.
  - Perceived end-user requirements.
  - Vendor conviction brought to bear on users.

CSI REAL END-USER REQUIREMENTS

- 1986 initiated some major changes in user purchasing patterns of systems and information services. First, a "digestive pause" began while users reevaluated their information system strategic (centralized? DDP? networked?), their software strategies (operating systems for the 1990s? 4GL?), and their use of PCs. (Note: it may well be that 1986 marked a swing away from IBM's centralized data processing philosophy toward DEC's distributed processing.)

- There is unmistakable evidence that users have recognized the need to interconnect their various data, text, voice, and image processing systems. There is also evidence that the majority of users feel they do not have the capabilities in-house to accomplish this. This integration effort targets hardware, software, and networks, and requires a mix of all three disciplines from any prospective CSI vendor. It is likely that a lot of end-user expenditures will be directed to integrating and complementing their existing systems through 1990, rather than adding more of same.

CSI PERCEIVED NEEDS

- The second thrust motivating end users in their information sytems expenditures is the established fact of a hardening of competition for all categories of activity in the commerical world. To be able to respond rapidly and accurately to market need, there is an ever-increasing need for real-time information on a wide range of data (e.g., sales, manufacturing capacity, cash flow, credit verification, etc.).

- Part of this is a real need leading to direct benefits in margin, profit, inventory control, collections, etc., but part is also only a perceived need based on the fear of the competitor "gaining an edge." This is particularly true in banking and finance circles and in companies dependent on Department of Defense business. All it takes is for one major supplier to adopt an approach/system that apparently offers major advantages in information flow and the rush to imitate is on creating a market.

VENDOR CONVICTION

- The combined marketing power of systems and information services vendors is enormous. It can convince the users of the need for products/services that may or may not be timely, necessary, or even real. An example is "office automation," a concept now three years old and whose time is still to come. On the back of this concept a lot of product was sold, without ever really addressing the core issue of paper handling and procedures.

- In the case of CSI is is evident that the vendors are not blowing smoke this time. The number of large integration projects is growing by the minute as is their scope, complexity, and impact. The danger is that vendors will engage in projects beyond their capabilities or beyond the ability of the user (to

absorb and use the new system). The risk is real that disgruntled users will sue for loss of earnings, disrupted factories, lost business, etc.

- Another force driving vendors is the sudden cutback in 1986 of defense spending. With the Democrats in control of both Congress and the Senate, further cuts can be expected. It is sensible, therefore, to transfer capabilities (and growth expectations) out of the federal market and into the commercial market.

- In 1986 INPUT has seen the competition of CSI planning groups in 11 of its major clients who are vendors and has knowledge of 8 others. In addition, INPUT interviewed 200 of the Fortune 1000 companies in 1986 and identified 40 major projects in CSI either underway or funded. Even vendors who are cutting back on staff (e.g., UNISYS) or who have frozen hiring (e.g., IBM) have made an exception of CSI-related budgets.

- Over the next page, representative contracts are listed that show the size, complexity, and scope of CSI activities already begun. It is based on this growing body of data that INPUT has produced its forecasts for the overall CSI market and for its component activities.

REPRESENTATIVE CONTRACTS

USER	VENDOR	PROJECT
United Airlines	IBM	Ticketing/Reservations ($20 million)
American President Lines	EDS	Order Processing
Wisconsin Bell	McDonnell Douglas	Mechanic Assignments

Southland Corporation	Syntech International	(proprietary)
Detroit Edison	EDS	Materials
Allegheny Power	IBM	Electronic Meter Reading
NY Electric and Gas	EDS	Records Management
Portland Gas	TRW	Load Monitoring/ Control
Continental Can	GEISCO	Quality Control Systems
Georgia Pacific	Arthur Andersen	Account Sales Research
NYSE	Arthur Andersen	Bond Buyer Network
(proprietary)	Arthur Andersen	Network Management with AI
Firestone	Systems Control	Robotics/QC ($21 million)
Northrup	(not assigned)	Five-Mile Square Fiber Optics ($50 million)
General Dynamics	Westinghouse	FMS Automation
General Motors	EDS	Company-Wide Network

- Also known to have major projects underway (but no details): American Motors, Cummins (E-mail), Ryder (policy management), Leaseway (auto leasing), Schering (financial planning), May Department Stores (accounting), Texaco, Mobil, Raytheon, and Scott Paper.

- INPUT interviewed a 200-company sample for their involvement in CSI projects at the present time. Results are provided below for each industry sector of Fortune 1000 companies only (DO NOT EXTRAPLOATE).

Sector	Percent Involved with CSI Currently
Discrete Manufacturing	23
Process Manufacturing	8
Telecoms	10
Insurance	12
Distribution	16
Utilities	19
Transportation	12
Health Care	5

COMMERCIAL SYSTEMS INTEGRATION FORECAST DATABASE

INDUSTRY DATA ELEMENT	MARKET SIZE 1986	MARKET SIZE 1991	AAGR '86/91
TOTAL ALL INDUSTRIES			
NO. OF LARGE ESTABLISHMENTS	10360	11640	2%
EST. WITH MAJOR PROJECTS (%)	18%	33%	12%
NUMBER OF MAJOR PROJECTS	1860	3860	16%
AVERAGE PROJECT VALUE ($M)	$4.4	$5.5	5%
TOTAL MAJOR PROJECT EXP. ($M)	$8,140	$21,300	21%
EXPENDITURES CONTRACTED (%)	21%	39%	12%
TOTAL SI CONTRACT VALUE ($M)	$1,690	$8,290	37%
TOTAL SI EXPENDITURES ($M)	$1,080	$5,400	38%
SI COMPONENT EXPENDITURES ($M)			
INFORMATION SYSTEMS (H/W)	$323	$1,510	36%
COMMUNICATIONS (HARDWARE)	$77	$435	41%
APPLICATIONS SOFTWARE PACKAGES	$37	$200	41%
SYSTEMS SOFTWARE PACKAGES	$26	$120	35%
CONSULTING SERVICES	$73	$360	
PROJECT MANAGEMENT FEES	$58	$295	38%
DESIGN/INTEGRATION	$125	$633	38%
SOFTWARE DEVELOPMENT	$312	$1,560	38%
EDUCATION/TRAINING & DOCUMENTATION	$20	$107	40%
OPERATION & MAINTENANCE	$18	$100	42%
OTHER EXPENDITURES	$12	$80	45%
TOTAL SI EXPENDITURES ($M)	$1,080	$5,400	38%

III VENDOR PROFILES